Alg. 2 Warm Up # 3-1

This is Week 3, day 1.
Name and Team # at the top!

1. Solve:

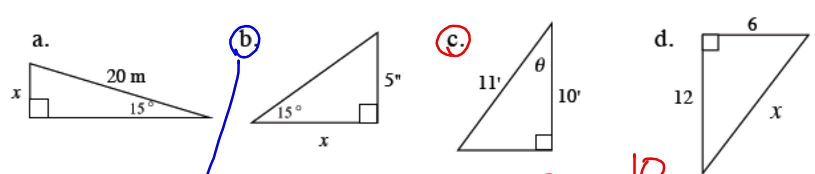
   a) $-2(x + 4) = 35 - (7 - 4x)$ b) $\dfrac{x - 4}{7} = \dfrac{8 - 3x}{5}$

2. Solve for the indicated variable:

   a) $V = lwh$; for h   b) $A = \pi r^2$; for r

HW Questions:

1-60. For each diagram below, write and solve an equation to find the value of each variable. Give your answer to part (d) in both radical and decimal form. For a reminder of the trigonometry ratios, refer to the Math Notes box for this lesson.



$x(\tan 15°) = \dfrac{5}{x} \cdot x$

$\dfrac{x\,(\cancel{\tan 15°})}{(\cancel{\tan 15°})} = \dfrac{5}{(\tan 15°)}$

$x \approx$

$\cos\theta = \dfrac{10}{11}$

$\theta = \cos^{-1}\left(\dfrac{10}{11}\right)$

$\theta \approx 24.6°$

1-65. Compute each of the following values for $f(x)=\frac{1}{x-2}$.

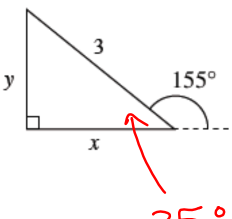
a. $f(2.5)$

b. $f(1.75)$

c. $f(2)$

d. Justify your answer for part (c).

1-67. A 3-foot indoor children's slide must meet the ground very gradually and make an angle of 155°, as shown in the diagram at right. Find the height of the slide (y) and the length of the floor it will cover (x).



SOH CAH TOA

$\cos 25° = \frac{x}{3}$

$x = 3(\cos 25°)$

$x \approx 2.7$ ft

$\sin 25° = \frac{y}{3}$

$3(\sin 25°) = y$

$y \approx 1.3$ ft

1-70. Solve each of the following equations.

a. $\frac{3}{x}+6=-45$

b. $\frac{x-2}{5}=\frac{10-x}{8}$

cross multiply.

$8(x-2)=5(10-x)$

c. $(x+1)(x-3)=0$

$x+1=0 \quad x-3=0$

$\boxed{x=-1, 3}$

1-72. Rearrange each equation below by solving for x. Write each equation in the form $x =$ ______. (Note that y will be in your answer).

a. $y = \frac{3}{5}x + 1$

b. $3x + 2y = 6$

c. $y = x^2$

d. $y = x^2 - 100$

$\pm\sqrt{y+100} = \sqrt{x^2}$

$x = \pm\sqrt{y+100}$

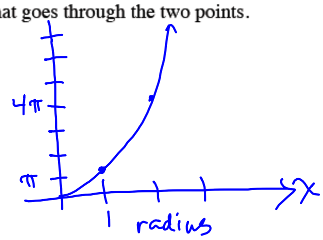
1-73. Consider circles of different sizes. Create multiple representations of the function ($x \to y$ table, equation, and graph) with inputs that are the radius of the circle and outputs that are its area.

1-74. Consider the points $(-2, 5)$ and $(5, 2)$ as you complete parts (a) and (b) below.

a. Plot the points and find the distance between them. Give your answer both in simplest radical form and as a decimal approximation.

b. Find the slope of the line that goes through the two points.

x (r)	y ($A = \pi r^2$)
1	π
2	4π
3	9π



equation: $y = \pi x^2$

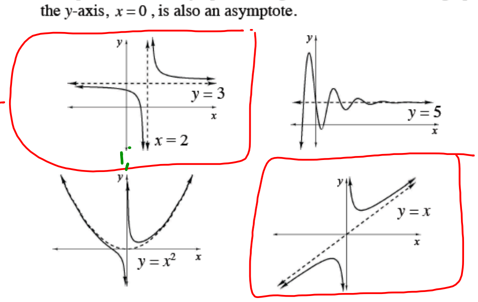
MATH NOTES

METHODS AND MEANINGS p.37

Graphs with Asymptotes

A mathematically clear and complete definition of an asymptote requires some ideas from calculus, but some examples of graphs with **asymptotes** should help you recognize them when they occur. In the following examples, the dotted lines are the asymptotes, and the equations of the asymptotes are given. In the two lower graphs, the y-axis, $x = 0$, is also an asymptote.

$y = \frac{\quad}{x-2}$



As you can see in the examples above, asymptotes can be diagonal lines or even curves. However, in this course, asymptotes will almost always be horizontal or vertical lines. The graph of a function has a **horizontal asymptote** if as you trace along the graph out to the left or right (that is, as you choose x-coordinates farther and farther away from zero, either toward infinity or toward negative infinity), the distance between the graph of the function and the asymptote gets closer to zero.

A graph has a **vertical asymptote** if, as you choose x-coordinates closer and closer to a certain value, from either the left or right (or both), the y-coordinate gets farther away from zero, either toward infinity or toward negative infinity.

Green CP's from Friday *Further Guidance*

1-79. This function is different from others you have seen in the past. To get a complete graph, you will need to make sure your table includes enough information.

We did h=3 and used x-values from -2 to 8.

$y = \frac{1}{x-3}$

x	y
1	$-\frac{1}{2}$
2	-1
3	∅
4	1
5	$\frac{1}{2}$

a. Make an $x \rightarrow y$ table with integer x-values from 5 less than your value of h to 5 more than your value of h. For example, if you are working with $h = 7$, you would begin your table at $x = 2$ and end it at $x = 12$. What do you notice about all of your y-values?

b. Is there any x-value that has no y-value for your function? Why does this make sense?

c. Plot all of the points that you have in your table so far.

d. Now you will need to add more values to your table to see what is happening to your function as your input values get close to your value of h. Choose eight input values that are very close to your value of h and on either side of h. For example, if you are working with $h = 7$, you might choose input values such as 6.5, 6.7, 6.9, 6.99, 7.01, 7.1, 7.3, and 7.5. For each new input value, calculate the corresponding output and add the new point to your graph.

e. When you have enough points to be sure that you know the shape of your graph, sketch the curve.

Further Guidance section ends here.

Pink CP's: 1.2.2 Investigating Hyperbolas

$$y = \frac{1}{x - h}$$

Remember, to completely describe means:

Shape: curved or straight.

Does it have a special name? Line, Parabola, Hyperbola, Square Root, Step

Special points: x & y-intercepts

vertex or starting point

Continuous, not continuous or discrete (just points)

Domain & Range

Symmetry

Asymptotes

HW: 1-

#84 - 96 evens

Use graph paper!